

IN THE CLAIMS:

1. (Currently Amended) A method for machining a glass substrate, comprising the step of:

forming a ~~concave portion~~ V-shaped groove in a glass surface of a glass substrate, by irradiating said glass surface of said glass substrate to be machined with a laser beam from above said glass substrate in a state that said laser beam is condensed into a portion outside said glass substrate.

2. (Previously Presented) The method according to claim 1, wherein, in said state said laser beam is condensed in said portion outside and above said glass substrate.

3. (Previously Presented) The method according to claim 1, further comprising the step of:

changing a distance between a beam-condensing point of said laser beam and said surface of said glass substrate.

4. (Previously Presented) The method according to claim 1, further comprising the step of:

moving where said laser beam is condensed relatively in a direction parallel to said surface of said glass substrate.

5. (Previously Presented) The method according to claim 1, wherein said laser beam is pulsed light having a pulse width not larger than 10 picoseconds.

6. (Currently Amended) A V-shaped groove laser-formed in a surface of a glass substrate ~~by laser irradiation using a laser beam that is condensed above a surface of said glass substrate~~, wherein an angle of from 30 degrees to 120 degrees is formed between opposite side surfaces of said V-shaped groove; the V-shaped groove having a groove width in a range of 49-87 μm and a groove depth in a range of 19-67 μm .

Claims 7-11 (Cancelled previously, as non-elected)

1 12. (Currently Amended) ~~The A~~ method of claim ~~1~~ for machining a glass
2 substrate, comprising the step of:
3 forming a concave portion in a glass surface of a glass substrate, by
4 irradiating said glass surface of said glass substrate to be machined with a laser
5 beam from above said glass substrate in a state that said laser beam is condensed
6 into a portion outside said glass substrate;
7 wherein the concave portion in the glass substrate has a conical hole
8 shape.

13. (Cancelled)

1 14. (Previously Presented) The method of claim 1, wherein the glass substrate has
2 dimensions of about 20 mm x 30 mm x 2 mm.

1 15. (Currently Amended) The method of claim ~~13~~ 1, wherein the V-shaped groove
2 has a groove width in a range of 49-87 μm and a groove depth in a range of 19-67
3 μm .

1 16. (Currently Amended) The method of claim ~~13~~ 1, the V-shaped groove having
2 respective side surfaces with an angle θ between side surfaces in a range of 30-120
3 degrees.

1 17. (Currently Amended) A method of forming a V-shaped groove in a glass
2 surface of a glass substrate, comprising:
3 disposing the glass surface of the glass substrate below a beam-condensing
4 point of a laser-beam; and
5 irradiating said glass surface of said glass with said laser beam.

1 18. (Currently Amended) The method of claim 17, wherein the laser beam is a
2 pulsed laser.

- 1 19. (New) A method for machining a glass substrate, comprising the step of:
- 2 forming a concave portion in a glass surface of a glass substrate, by
- 3 irradiating said glass surface of said glass substrate to be machined with a laser
- 4 beam from above said glass substrate in a state that said laser beam is condensed
- 5 into a portion outside said glass substrate.